

REMARKS

Claims 1-13, 33, and 35 have been amended. Claims 37-41 have been added. Claims 14-32 have been withdrawn. The applicant affirms the election without traverse of Group I, claims 1-13 and 33-36. Claims 1-13 and 33-41 are now pending. Of these, claims 1, 3 and 33 are independent claims.

Claims 1, 3-7, 10, 12, 13, 33, 34 and 36 stand rejected and provisionally rejected under the doctrine of obviousness-type double patenting. Claims 1, 3-7, 10, 12, 13, 33, 34 and 36 stand rejected under 35 U.S.C. Section 102(b). Claims 1-13 and 33-36 stand rejected under 35 U.S.C. 103(a).

Obvious-Type Double Patenting Rejections

Claims 1-13 and 33-36 stand rejected under the doctrine of obviousness-type double patenting as being unpatentable over claims 1-50 of U.S. Patent No. 5,949,927. Claims 1-13 and 33-36 also stand provisionally rejected as being unpatentable over claims 1-31 of copending U.S. Patent Application No. 09/134,147.

To obviate the rejections, the applicant encloses terminal disclaimers made pursuant to 37 C.F.R. Section 1.321(b).

102 Rejections

Claims 1, 3-7, 10, 12, 13, 33, 34 and 36 stand rejected under 35 U.S.C. 102(b) as being anticipated by Ogawa (JP 57-138575).

Amended claim 1 now recites: "An apparatus for chemical mechanical polishing of a wafer, comprising: (a) a platen supporting a polishing surface; (b) a chuck to hold the wafer against the polishing surface; (c) a motor coupled to at least one of the polishing surface and the chuck to generate relative motion therebetween; and (c) an endpoint detector, comprising (c1) a light source operable to generate a light beam that is directed through the polishing surface to the wafer and produce, from the light beam that is directed through the polishing surface, a light beam reflected from the wafer, and (c2) a receiver operable to receive the light beam reflected from the wafer, wherein the endpoint detector is operable to determine, based on the light beam reflected from the wafer, when an end point is reached."

The applicant respectfully notes that claim 1 includes limitations not disclosed by Ogawa and, hence, is not anticipated by Ogawa. For example, the (c1) limitation of claim 1 recites "a light source operable to generate a light beam that is directed through the polishing surface to the wafer." Ogawa discloses a laser light that is directed through a piercing hole 15 on a work holder 14. Ogawa's laser light is not, however, transmitted through its polishing cloth 10. Thus, Ogawa fails to disclose the (c1) limitation of claim 1. For at least this reason, claim 1 and claim 2, which depends from claim 1, should be allowed.

Amended claim 3 now recites: "A chemical mechanical polisher, comprising: a polishing surface that is movable relative to a substrate; at least one light source operable to transmit light through the polishing surface to a film on the substrate and produce, from the light that is transmitted through the polishing surface, light reflected from the film on the substrate; and at least one device operable to detect a change in the light reflected from the film on the substrate."

The applicant respectfully notes that claim 3 includes limitations not disclosed by Ogawa. For example, the second limitation of claim 3 recites "at least one light source operable to transmit light through the polishing surface to a film on the substrate." For reasons similar to those discussed above with respect to claim 1, Ogawa does not disclose the second limitation of claim 3. For at least this reason, claim 3 and the claims depending therefrom should be allowed.

Amended claim 33 now recites: "A chemical mechanical polisher, comprising: a polishing material having at least one optical access through which light can be transmitted to a portion of a film on a substrate; a platen to support the polishing material; and an interferometer operable to detect interferometric changes in light reflected off the film and passing through the optical access in the polishing material."

The applicant respectfully notes that claim 33 includes limitations not disclosed by Ogawa and, hence, is not anticipated by Ogawa. For example, the first limitation of claim 33 recites "a polishing material having at least one optical access through which light can be transmitted to a portion of a film on a substrate." Ogawa discloses a lapping machine 9 on which a polishing cloth 10 is placed. However, neither Ogawa's lapping machine 9 nor its polishing cloth 10 includes an optical access. Thus, Ogawa fails to disclose the first limitation of claim 33. For at least this reason, claim 33 and the claims depending therefrom should be allowed.

103 Rejections

Claim 1 stands rejected under 35 U.S.C. Section 103(a) as being unpatentable over Akino (JP 3-234467), to which the Examiner refers to as "Kokai (3-234467)". As indicated above, the applicant has amended claim 1.

The applicant respectfully submits that claim 1 includes limitations not suggested by Akino and, hence, is not rendered obvious by Akino. For example, the (c) limitation of claim 1 recites "an endpoint detector, comprising (c1) a light source operable to generate a light beam that is directed through the polishing surface to the wafer and produce, from the light beam that is directed through the polishing surface, a light beam reflected from the wafer, and (c2) a receiver operable to receive the light beam reflected from the wafer, wherein the endpoint detector is operable to determine, based on the light beam reflected from the wafer, when an end point is reached."

As recited, the end point detector uses the light beam reflected from the wafer to determine when an end point is reached. In contrast, Akino discloses a sensor 3a that uses light reflected off a measuring plane 2a of a protective disk 2. Figure 1, for example, shows the measuring light 3d being reflected from the measuring plane 2a. Akino's measuring plane 2a is not a wafer. The measuring plane is not being polished and does not make contact with the polishing surface and, thus, cannot be considered to be a wafer.

Furthermore, page 9 of the enclosed translation describes using only the light reflected from the measuring plane 2a of the protective disk to calculate displacement. There is no mention that any other type of light is used to calculate displacement. The applicant respectfully submits that Akino's disclosure of using only light reflecting off the measuring plane 2a, which is not a wafer, to calculate displacement does not suggest the applicant's claimed endpoint detector, which calculates endpoint based on light reflected from a wafer. Accordingly, Akino fails to suggest the applicant's claimed endpoint detector. For at least the above reason, claim 1 and claim 2, which depends from claim 1, should be allowed.

Amended claim 3 includes limitations not suggested by Akino. For example, the third limitation of claim 3 recites "at least one device operable to detect a change in the light reflected from the film on the substrate and determine, based on the detected change, when an end point is reached." For reasons similar to those discussed above with respect to the 103(a) rejection of

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claim 1, Akino fails to suggest the third limitation of claim 3. For at least this reason, claim 3 and claims depending therefrom should be allowed.

Amended claim 33 includes limitations not suggested by Akino. For example, the third and fourth limitations of claim 33 recites "an interferometer operable to detect interferometric changes in light reflected from the film and passing through the optical access in the polishing material; and a device operable to determine, based on the detected interferometric changes, when an end point is reached." For reasons similar to those discussed above with respect to the 103(a) rejection of claim 1, Akino fails to suggest the third and fourth limitations of claim 33. For at least this reason, claim 33 and claims depending therefrom should be allowable.